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(54) HIGH-HARDNESS HIGH-TOUGHNESS STEEL AND TRACK-LAYING PARTS USING THE STEEL MATERIAL, SAND ABRASION RESISTANT PARTS, FASTENING BOLT, HIGH-TOUGHNESS TOOTHED GEAR, HIGH- TOUGHNESS HIGH-BEARING PRESSURE RESISTANCE TOOTHED GEAR, AND ABRASION RESISTANT STEEL SHEET

(57)Abstract:
PROBLEM TO BE SOLVED: To provide a high-hardness high-toughness steel which more appropriately contains Si, Al, Cr, Mo, V, W, Ni and Co, and has hardness of HRC 50 or higher and a Charpy impact value of 5 kg-m/cm2 or higher, after being tempered at a high temperature of 600°C or higher.
SOLUTION: The high-hardness high-toughness steel is a tempered martensitic steel which comprises at least 0.15-1.2 wt.% C and 0.05-1.8 wt.% Si, 0.15-1.6 wt.% Al for substituting a part of Si, 0.3-2.5 wt.% added Ni, further 0.1-3.5 wt.% Cr and 0.1-1.7 wt.% Mo added so as to satisfy the expression of Mo (wt.%)=1.7-0.5×(Si (wt.%)+Al (wt.%)) as the upper limit, one or both of 0.05-0.40 wt.% added V and 0.1-1.0 wt.% added W, furthermore one or more alloying elements of Mn, Co, Cu, Ti, B and Nb, inevitable impurities like P, S, N and O, and the balance substantially Fe.

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